WHAT IS CLAIMED IS:

1.   A method comprising:

obtaining an output signal sequence from a partial response channel;

determining an input sequence of the partial response channel by maximizing a correlation metric of an estimated output sequence with the obtained output sequence, the estimated output sequence being estimated based on the partial response channel; and

providing an output corresponding to the determined input sequence.

2.   The method of claim 1, wherein said determining the input sequence comprises employing Viterbi detection using a cross-correlation branch metric.

3.   The method of claim 2, wherein the partial response channel has a transfer function defined according to a target polynomial, $T(D) = p_0 + p_1 D + \cdots + p_M D^M$, the Viterbi detection operates according to a trellis having 2^M states, and all survivor paths associated with all the 2^M states in the trellis merge in M steps.

4.   The method of claim 1, wherein said providing the output corresponding to the determined input sequence comprises providing the determined input sequence to an additional sequence processing component.

5.   The method of claim 1, wherein the output signal sequence comprises a convolution of the input sequence and a target polynomial of the partial response channel.

6.   The method of claim 1, wherein the partial response channel comprises a data storage medium, and said obtaining the output signal sequence comprises sampling a signal generated from the data storage medium.

32

7.   A machine-readable medium embodying information indicative of instructions for causing one or more machines to perform operations comprising:

obtaining an output signal sequence from a partial response channel;

determining an input sequence of the partial response channel by maximizing a correlation metric of an estimated output sequence with the obtained output sequence, the estimated output sequence being estimated based on the partial response channel; and

providing an output corresponding to the determined input sequence.

8.   The machine-readable medium of claim 7, wherein said determining the input sequence comprises employing Viterbi detection using a cross-correlation branch metric.

9.   The machine-readable medium of claim 8, wherein the partial response channel has a transfer function defined according to a target polynomial, $T(D) = p_0 + p_1 D + \cdots + p_M D^M$, the Viterbi detection operates according to a trellis having 2^M states, and all survivor paths associated with all the 2^M states in the trellis merge in M steps.

10. The machine-readable medium of claim 7, wherein providing the output corresponding to the determined input sequence comprises providing the determined input sequence to an additional sequence processing component.

11. The machine-readable medium of claim 7, wherein the output signal sequence comprises a convolution of the input sequence and a target polynomial of the partial response channel.

12. The machine-readable medium of claim 7, wherein the partial response channel comprises a data storage medium, and said obtaining the output signal sequence comprises sampling a signal generated from the data storage medium.

13. An apparatus comprising:

a branch metric generator that generates branch metrics comprising a correlation of obtained output sequences and estimated output sequences for a partial response channel;

an add-compare-select component that compares paths and determines survivor paths using generated branch metrics;

a memory that retains metrics information; and

a trace-back component that determines a best path of the survivor paths and outputs sequence information based on the determined best path.

14.   The apparatus of claim 13, wherein the add-compare-select component compares paths and determines survivor paths by maximizing a quantity defined according to an equation,

$\sum_{k=0}^{N} y_k \cdot y_k^*$, where N corresponds to a sequence length, y_k corresponds to a real channel output, and y_k^* corresponds to an estimated channel output.

15.   The apparatus of claim 13, wherein the partial response channel has a transfer function defined according to a target polynomial, $T(D) = p_0 + p_1 D + \cdots + p_M D^M$, and all the survivor paths merge in M steps.

16.   The apparatus of claim 15, wherein the memory comprises a path memory of length M.

35

17. An apparatus comprising:

means for obtaining an output signal sequence from a partial response channel;

means for determining an input sequence of the partial response channel by maximizing a correlation metric of an estimated output sequence with the obtained output sequence, the estimated output sequence being estimated based on the partial response channel; and

means for providing an output corresponding to the determined input sequence.

18. The apparatus of claim 17, wherein said means for determining comprises Viterbi means for generating a cross-correlation branch metric.

19. The apparatus of claim 18, wherein the partial response channel has a transfer function defined according to a target polynomial, $T(D) = p_0 + p_1 D + \cdots + p_M D^M$, the Viterbi means operates according to a trellis having 2^M states, and all survivor paths associated with all the 2^M states in the trellis merge in M steps.

20. The apparatus of claim 17, wherein the partial response channel comprises a data storage medium.

21.   A system comprising:

an input line that provides a sampled channel sequence; and

Veterbi detection means for determining a recovered sequence from the sampled channel sequence, the Viterbi detection means including means for maximizing correlation of the recovered sequence and the sampled channel sequence without also minimizing a probability of making an error in determining the recovered sequence.

22.   The system of claim 21, wherein the sampled channel sequence comprises a waveform of widely varying amplitude, and the Viterbi detection means provides robust tolerance of phase uncertainty with the widely varying amplitude waveform.

23.   The system of claim 21, further comprising a head-disk assembly comprising the input line.

24. A data storage system comprising:

an input line that provides a sampled channel sequence from a data storage medium; and

Veterbi detection means for determining a recovered sequence from the sampled channel sequence, the Viterbi detection means including means for maximizing correlation of the recovered sequence and the sampled channel sequence without also minimizing a probability of making an error in determining the recovered sequence.

25. The system of claim 24, wherein the sampled channel sequence comprises a waveform of widely varying amplitude, and the Viterbi detection means provides robust tolerance of phase uncertainty with the widely varying amplitude waveform.

26. The system of claim 24, further comprising a head-disk assembly comprising the input line.